

1948

# HUMIDITY CONTROL

is more important

in your plant

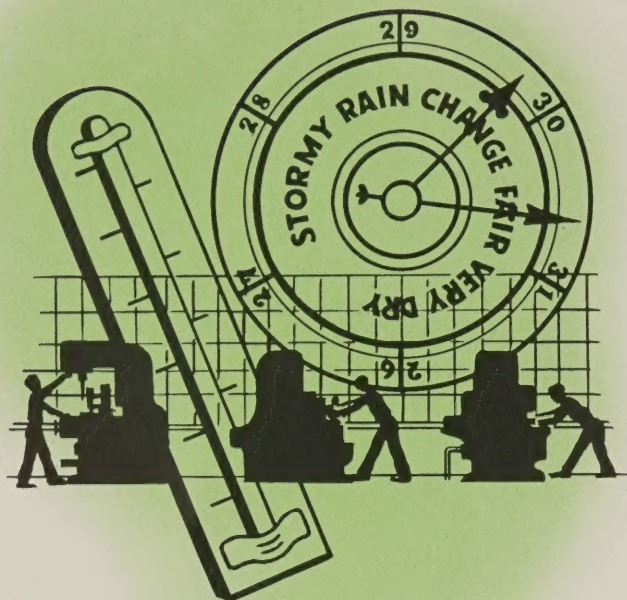
than you may

realize



**Kathabar** *System of*  
**HUMIDITY CONTROL**  
(ADVANCED AIR CONDITIONING)





The humidity and the temperature of the atmosphere both vary over a wide range. There is no set ratio. The temperature may be low with high humidity and vice versa.

Large sums of money have been spent to control air temperature for certain industrial processes only to discover that humidity control was what was actually required. When temperature and humidity are each controlled independently, any prescribed ratio of the two can be obtained to meet exactly the requirements of any industrial process. That is accomplished when Kathabar is a part of the system. As one industrial executive put it, "Kathabar has given us a new conception of air conditioning."

It is not necessary to cool or heat the air to remove the humidity. A much simpler method is now available for either removing or adding humidity.

## WHAT Kathabar is

**Kathabar is a machine which removes moisture from the air or adds moisture to the air in any selective amounts and under complete automatic control.**



It is not uncommon in hot weather to find it difficult to get salt out of the conventional salt shaker, because it has absorbed moisture from the air and become soggy. But when the salt shaker is heated, the moisture is driven off and the salt again pours readily.

The basic principle of Kathabar operation is just as simple as that. Instead of table salt (sodium chloride), Kathabar utilizes a solution of lithium chloride known as "Kathene".

Lithium chloride is a very practical salt for use in humidity control because of its great absorptive capacity and because it can readily be regenerated, that is, the moisture which has been absorbed can be easily removed. Furthermore, Kathene does not vaporize, it is non-toxic. In fact, it is just as harmless as table salt and it has a purifying effect on the air. There is no loss of Kathene to the air.

## HOW Kathabar operates

Referring to the accompanying flow chart, the air to be treated is passed through the contactor or air washer, Kathene being used instead of water as in the conventional air washer.

As the air comes into contact with the Kathene, its moisture is absorbed and the Kathene thus partially diluted flows into a sump. From this sump, it is pumped by a small centrifugal pump into two circuits.

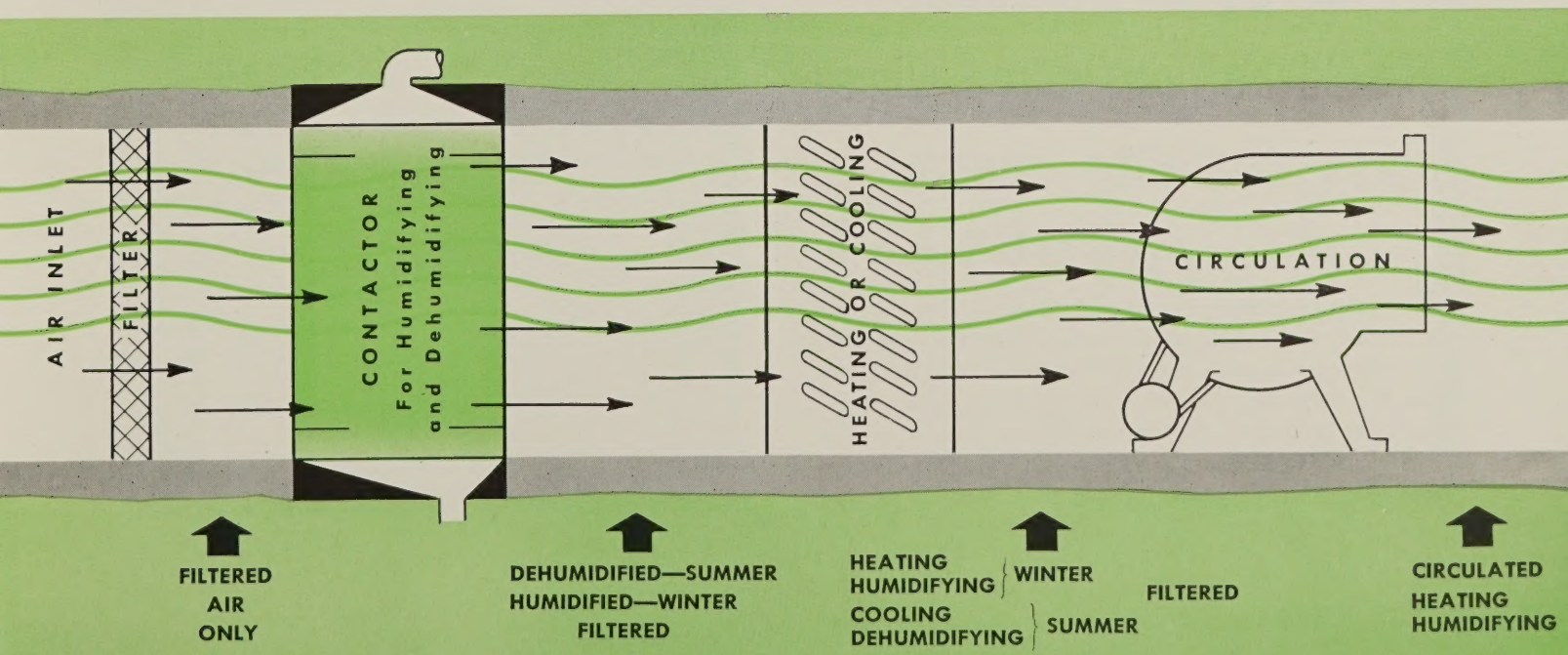
The main circuit draws from 85 to 90% of the solution to feed a cooler. Cooling medium may be cooling tower water, deep well water or refrigerant. Controlling the temperature of the Kathene regulates its absorptive power. The lower its temperature, the more moisture it will take out of the air. Thus, absorptive capacity is regulated by an immersion thermostat which actuates the water valve. A further temperature control can, if desired, be located in the stream of conditioned air from the contactor, to the drier, or to the space being humidity-conditioned.

The secondary circuit which carries the remaining 10 to 15% of the Kathene, carries it to a heater (low pressure or exhaust steam) where its temperature is raised to approximately 230°F. The hot Kathene is exposed to a stream of scavenger air, which removes the moisture previously picked up in the contactor. The temperature of the Kathene heater is automatically regulated from a density control in the sump.

These four functions, Kathene-air contact, regeneration, Kathene cooling and heating are all automatically controlled.

In the Kathabar Package Unit, the solution cooler is replaced by a finned coil in the contactor. Likewise, the solution heater is replaced by another finned coil in the regenerator. The regenerator and contactor are combined into one unit to form the Package Unit.

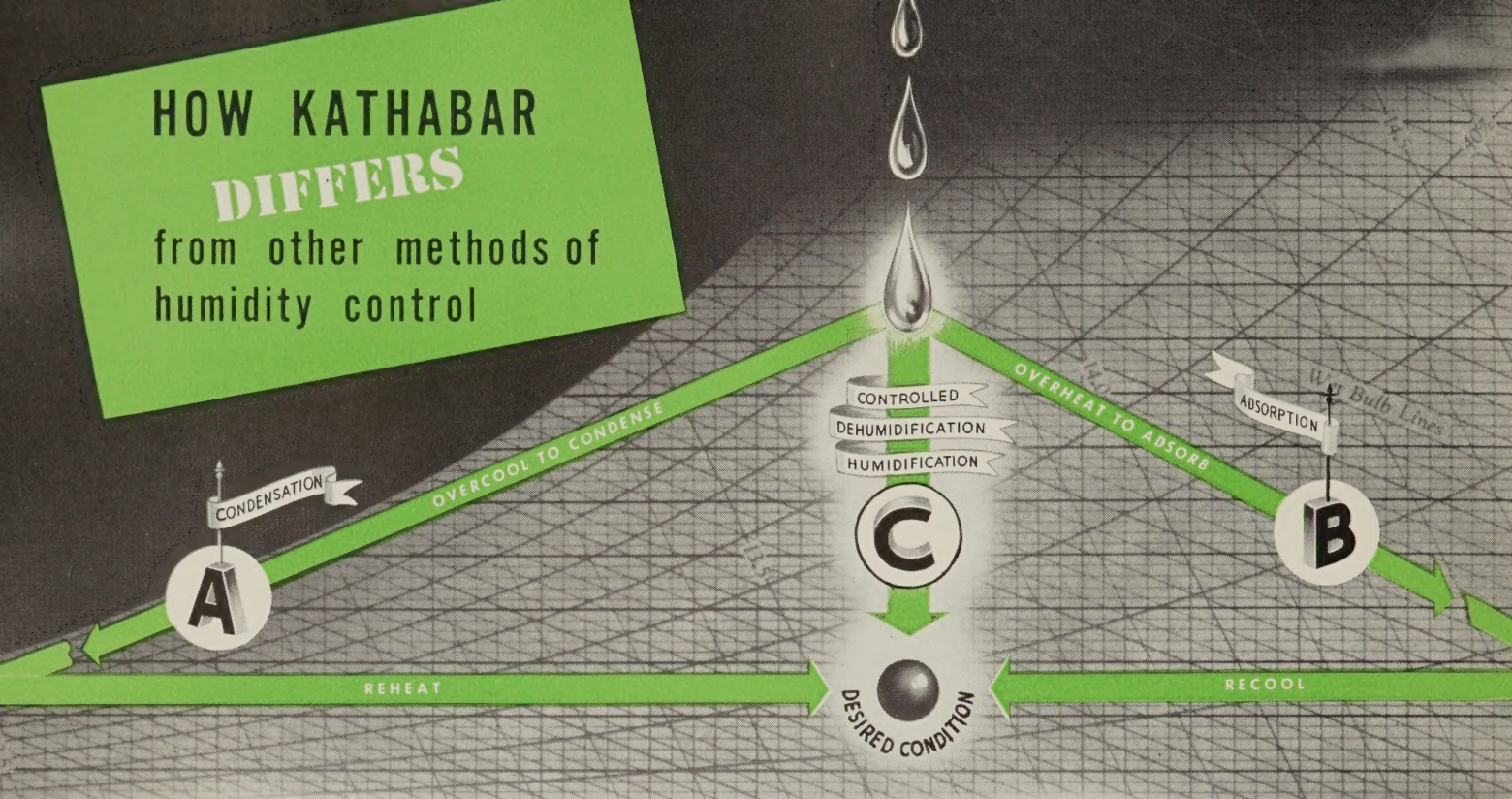






# HOW KATHABAR DIFFERS

from other methods of  
humidity control



The three methods of removing humidity from the air are illustrated here diagrammatically. **Course A** in this diagram indicates the method using refrigeration to cool the air below the dew point, after which it must be reheated to the desired temperature. **Course B** indicates the method using adsorbers, or dry dehumidifiers in which the air is heated to an excessively high temperature and again it must usually be cooled to the temperature at which it is used. **Course C**, the Kathabar System, reduces humidity directly to any desired humidity point with the minimum of temperature change either up or down.

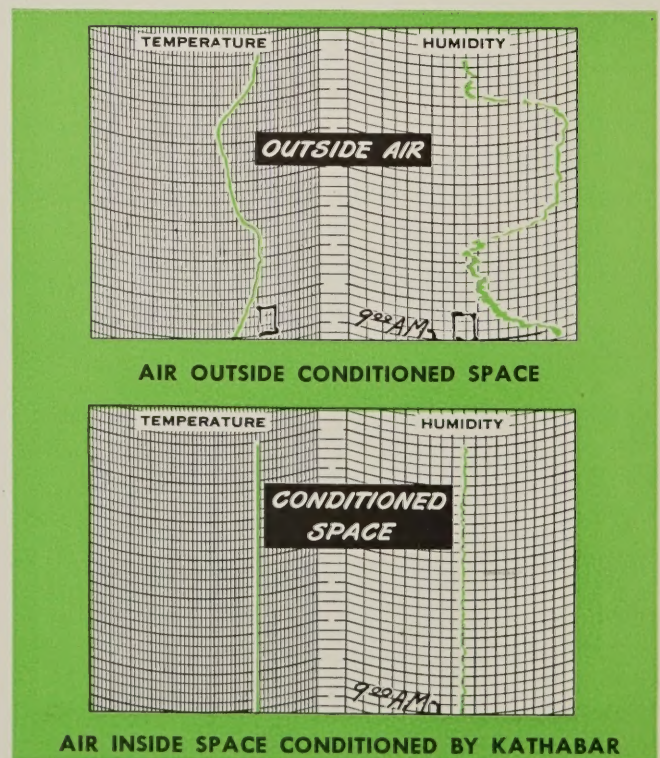
Obviously, the cost of **Course C** is only a small fraction of that of either **A** or **B**.

## WHY Kathabar should be considered where close humidity control is IMPORTANT

**1** Kathabar offers exceptional economy. Temperature changes are not required for dehumidification, and when low temperature air is not required, the costs of refrigeration and reheating are both saved. In many cases, it costs more just to reheat the over-cooled air than it does to operate the Kathabar System entirely. Kathabar uses low cost heat. In many cases, only exhaust steam is needed.

Kathabar uses only small pump and fan motors having uniform power requirements, which result in a favorable power factor.

**2** Kathabar provides air of uniform humidity consistently and regardless of what outside humidity may be, for Kathabar either dehumidifies or humidifies the air to maintain a selective ratio.





**3** Kathabar is dependable. Observation of installations where both Kathabar and other equipment are in parallel use, show Kathabar to have a much higher record for continuous operation. With only a small pump and a fan as operating elements, there is little danger of operating trouble.

**4** Kathabar requires no licensed engineers to operate it, and this is an important consideration in operating cost.

**5** Maintenance on Kathabar installations is unbelievably low for the same reasons as stated above.

## HOW Kathabar is applied

Because Kathabar can reduce humidity by any desired amount in one direct step, it is practicable to use for large volumes of air, such as those needed for an entire building.

Many plants thus treat their total intake air supply and conduct it through uninsulated ducts to various departments

in accordance with individual needs. The ducts need not be insulated, because there is no temperature difference between the treated air and the air outside the duct. For this reason, by-pass dampers, reheating equipment, water condensation on coils are all eliminated and the entire problem of air conditioning greatly simplified.

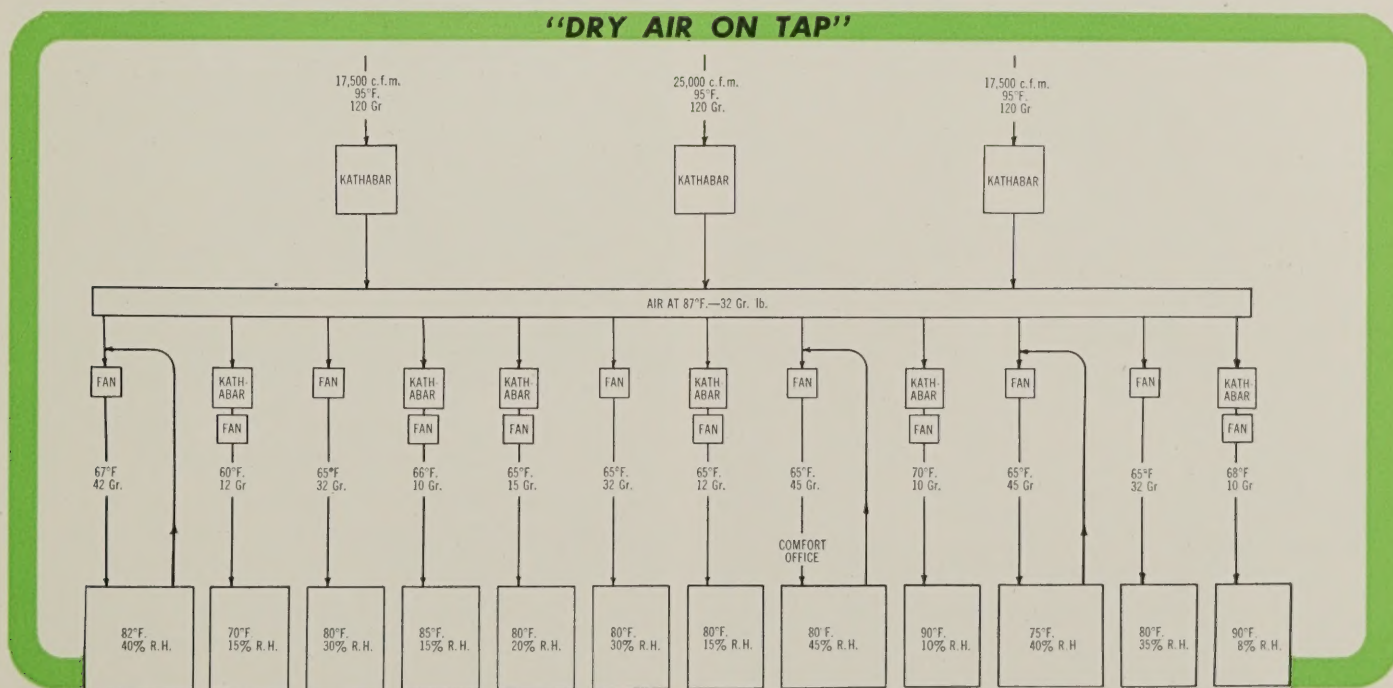
If certain departments or rooms in a plant require greater dehumidification than that of the main plant supply, small Kathabar Booster Units will provide it.

Kathabar is also profitably used to recondition recirculated air for special process control and to prevent frost on coils when air below 32°F is being used.

The supply of dry air for drying oven use is another popular application, especially when drying has to be done at comparatively low temperatures. Either outside air or recirculated air is passed through the Kathabar unit for this purpose.

A common application of Kathabar is the supply of dry air to foundry cupolas. The dryness of this air supply does not depend on the varying humidity conditions of the atmosphere, is not effected by the difficult operating conditions characteristic of foundry operation.

When the humidity of the blast air is under such close control, casting quality is materially improved, scrap losses greatly reduced, and metal analysis is much easier to control.



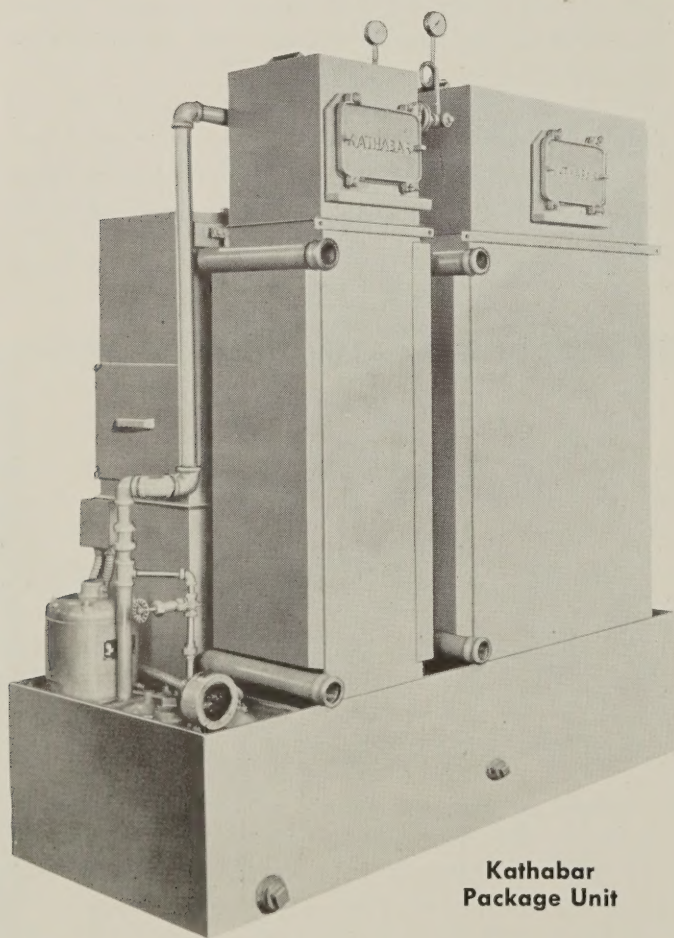


Kathabar is being used successfully to condition air in plants making precision ball bearings, instruments, etc., having highly polished surfaces which are very vulnerable to corrosion from air-borne moisture.

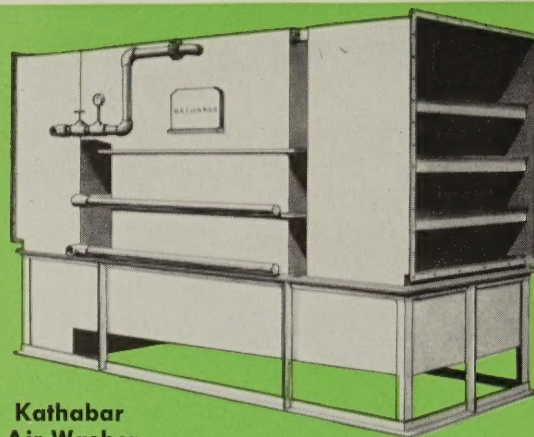
# Kathabar EQUIPMENT

The Kathabar Package Unit contains all necessary elements, pump, regenerator, contactor, sump and regenerator fan in one compact assembly. These units are available in four sizes—1350 cfm, 2500 cfm, 3500 cfm and 5000 cfm.

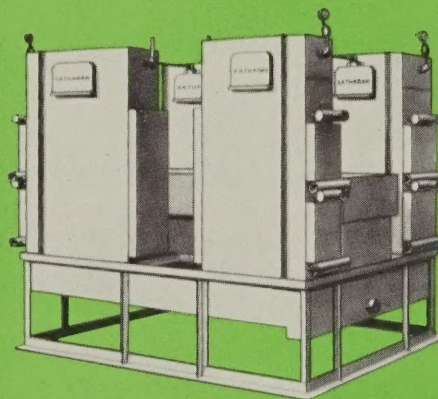
In the Standard Washer Unit, the contactor and regenerator are separated in order to make it practicable for one regenerator to serve several contactors. Capacities of these units are 12500 cfm and 17500 cfm. Groups of these washer unit type contactors can be nested together in a battery to provide practically any total capacity needed.



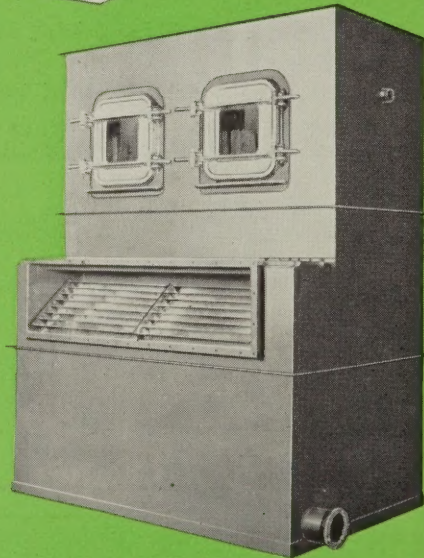
**Kathabar  
Package Unit**



**Kathabar  
Air Washer**



**Kathabar  
Vertical Coil  
Regenerator**

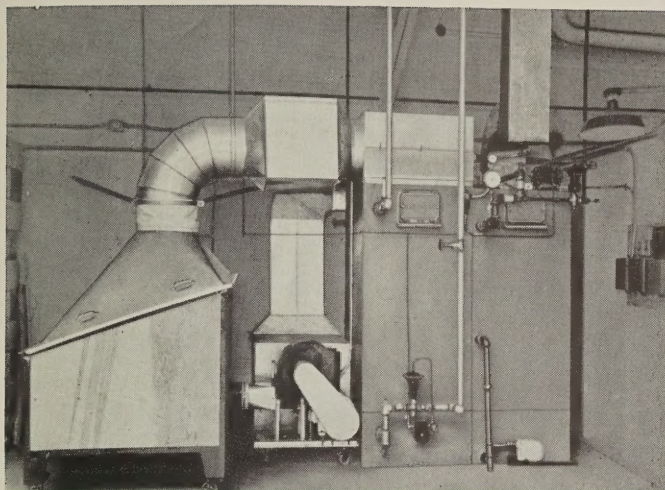


**Kathabar  
Heavy Duty  
Vertical  
Contactor**

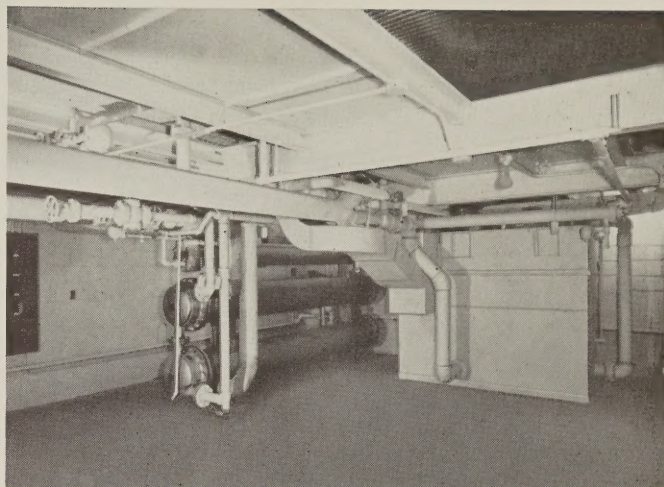
Kathabar is also available in heavy duty units which must operate consistently under extremely adverse air conditions, such as heavy dust concentrations. These units are especially constructed to give dependable service consistently.

Performance data on Kathabar installations is available on request.

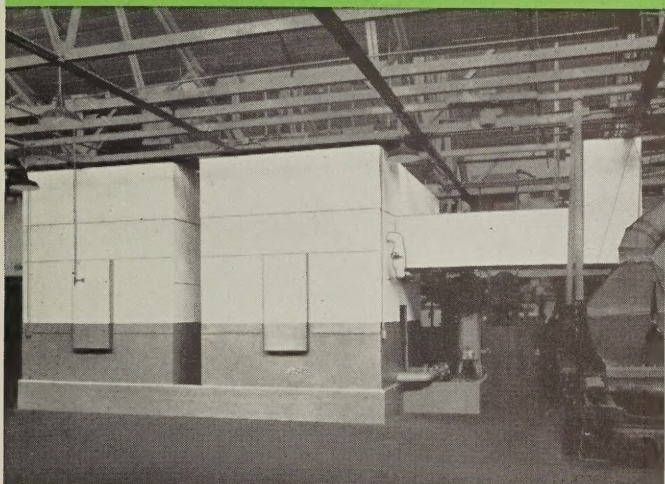




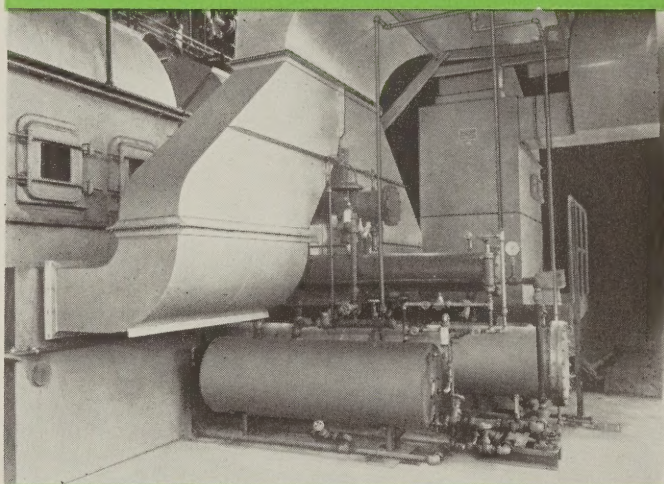
Package Unit for food dehydrating



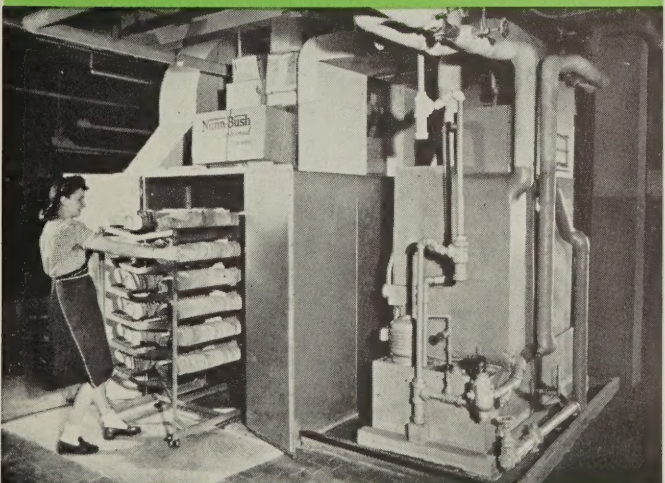
Central System in a gelatin products plant



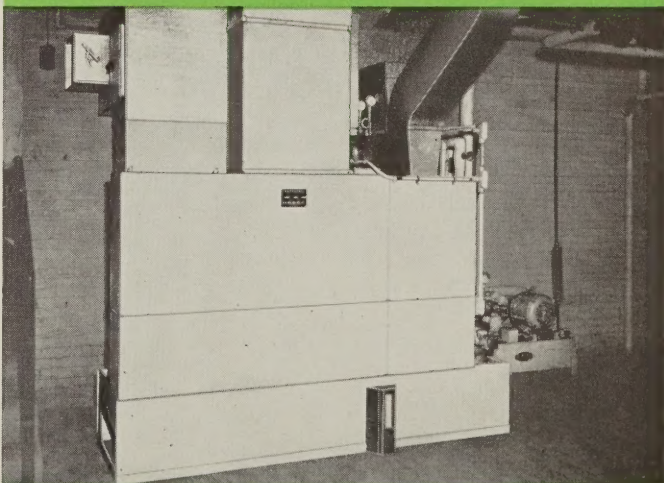
Installation in a plant making safety glass



Heavy duty unit in a foundry to provide a dry blast for the cupola

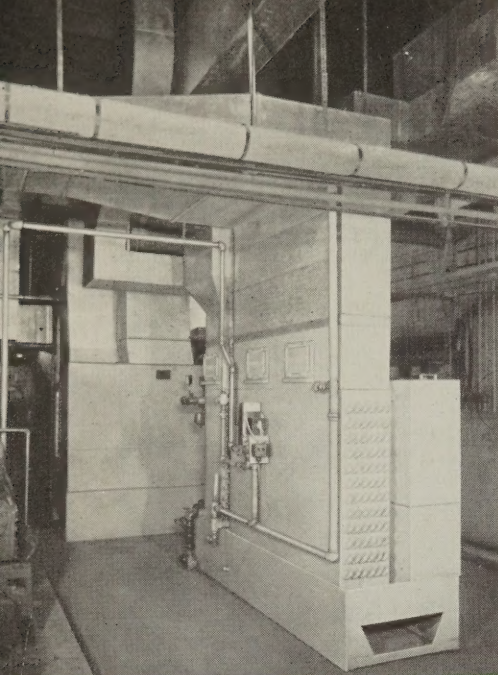


Installation for drying leather in the manufacture of shoes

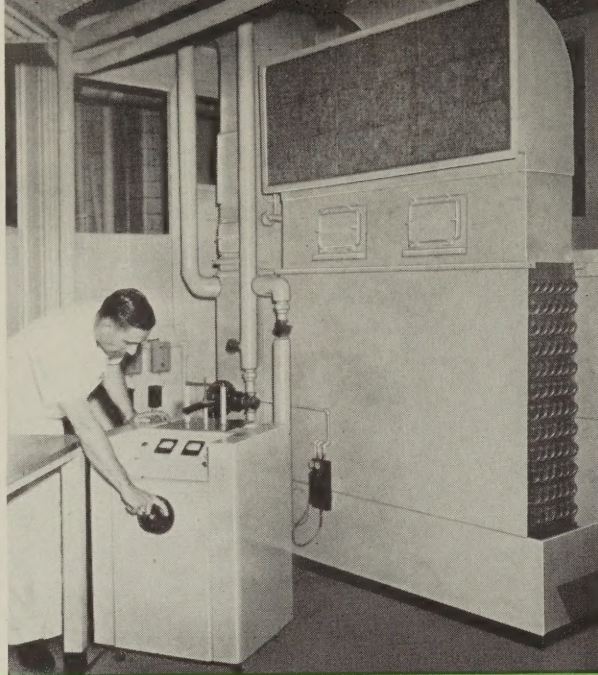


Installation for the drying of film and sensitized paper.

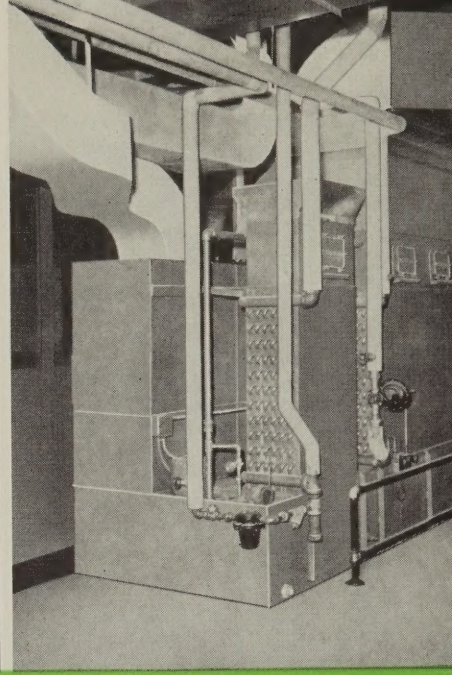




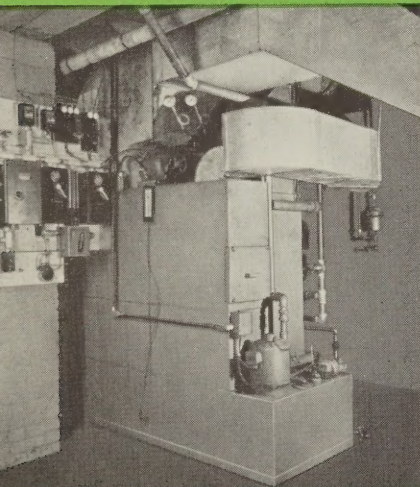
Installation in a plant  
processing food and drugs



Kathabar in a research laboratory



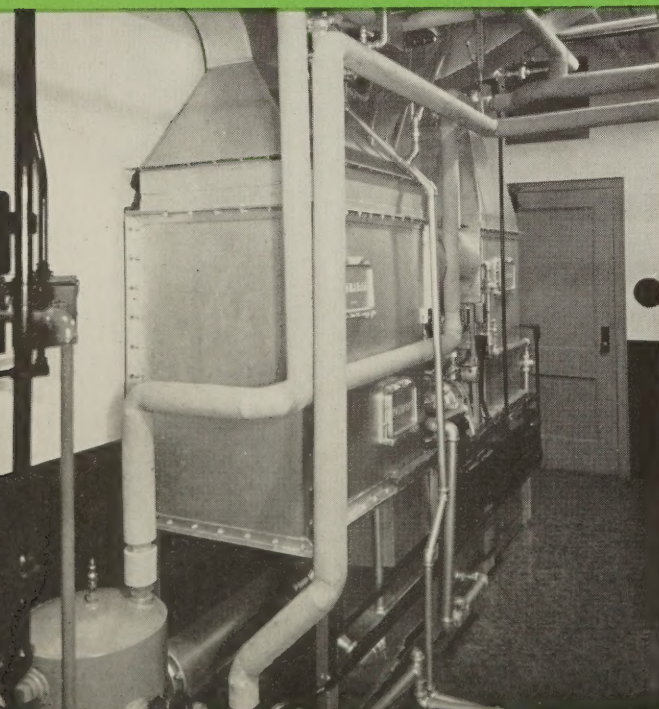
Package Unit in a  
pharmaceutical plant



Package Unit used for drying matches



Humidity Conditioning Room in which highly  
finished steel parts are finished



Installation in Paper Test Room

**Kathabar division**

**SURFACE**

COMBUSTION CORPORATION

TOLEDO 1, OHIO, U.S.A.